Trafinz Conference, Sep 2013

Cycling – Providing for this Safe & Efficient Mode of Transport

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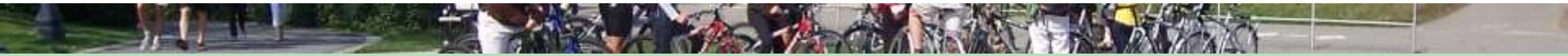
Dept of Civil & Natural Resources Engineering

Presentation Outline

Safety and Efficiency
The challenges of delivering both



- Risk and Cycling
- Why Make NZ Cycle-Friendly?
- How to Provide for Cycling?
  - Land Use Planning
  - Lower Speeds
  - Neighbourhood Greenways
  - Oh, and some Cycleways...
- What's Christchurch Doing?

…with a bit of research along the way…

It's not about "Cyclists..."

"People who Cycle"

Isn't Cycling Unsafe?

"Peak hour urban traffic is dangerous for cyclists… The best protection for cyclists is prohibition from peak hour urban roads"

"Really, you must have a screw loose to want to ride a bike on today's roads, you just don't know what nutter is behind the wheel."

Onlooker saves cyclist dragged under truck

CAROLINE KING

Last updated 08:55 30/07/2013

48 Like 312 Tweet 15 +1 Share

DEAN KOZANIC/Fairfax NZ

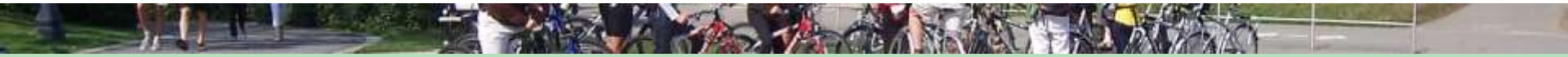
CRASH: Christchurch roofer Richard Mitchell says the truck dragged the cyclist up to 30 metres. The cyclist, in his 30s, is in an induced coma in Christchurch Hospital.

Risk of Cycle Crashes

- **Perceived** Risk influenced by:
  - Regular Negative Media
  - Lack of Familiarity with Cycling by many
  - Can't Control Behaviour of Other Road Users
  - Immediacy of Injury/Death
- **Actual** Calculated Risks in NZ:
  - 1 Cycling Death per **2.5 million hrs** cycled
  - 1 Serious Injury for every **20,000 hrs** cycled
  - Health benefits of cycling outweigh risks **20:1**

But it's Riskier than Driving, Right?

Koorey G.F., Wong W.K. (2013), "Is Cycling a Safe Mode? Comparing Apples with Apples", 16th International "Road Safety on Four Continents" Conference, Beijing, China, 15-17 May 2013.

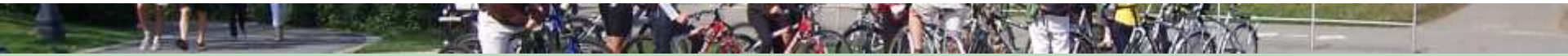


- Safety comparisons may not always be "comparing apples with apples"
  - Relative amount of **time** taken by each mode
  - Average **distance** travelled by different modes
  - **Age** distributions/"road experience" of travellers
  - Types of **road environments/facilities** ridden
  - Different crash **reporting** rates by mode
  - Cumulative **"safety in numbers"** effect
  - Relative **health** costs other than road crashes

Sometimes cycling not really more dangerous

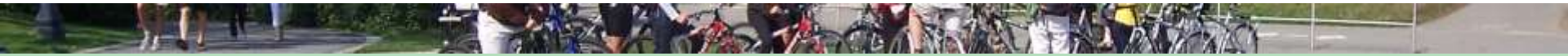
But it could be SafER

Koorey G.F. (2012), "Investigating common trends in New Zealand cycling fatalities", Proceedings Safety 2012 World Conference, Wellington, NZ, 1-4 Oct 2012, Injury Prevention, Vol.18 (Suppl.1), A221, doi:10.1136/injuryprev-2012-040590v.9



- Findings from Study into NZ Cycling Fatalities (84 cases, 2006-12)
  - ~Half are **rural** *(but <10% of riding)*
  - Half of victims are **aged 50+** (27% >65)
  - Cyclist fault prevalent at young and old ages
  - 30% involve a **Heavy Vehicle** (bus/truck)
  - 31% occurred on **State Highways** *(17% of km)*
  - >Half of drivers **did not see/look** for the rider
  - Helmet/Hi-Vis wearing did ***not*** change the risks
  - *Most common: Bike struck by passing m.veh*
    Then: Rider lost control, went off road, hit obj.

Why Make New Zealand Cycle-Friendly?



- Benefits for People who Bike
  - Improved Health
  - Financial Savings
  - Convenience
  - Independence
- Benefits for ***Others***
  - Reduced Congestion
  - Reduced Expenditure for Maintenance/Congestion
  - More Efficient Use of Public Space
  - More Dollars back into Local Economy

Evaluation of a City-Wide Cycle Network in Chch

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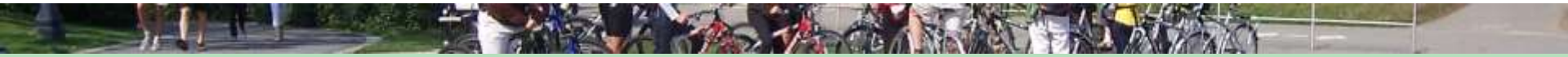
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND



- Estimated Cost: ~$70 million
- Conservative Benefits: ~$400-450 million
  - Only assumed ~40% growth in cycle numbers

➔ Estimated Benefit/Cost Ratio: >**6:1**

- *A similar study for an Auckland-wide cycle network (~$600m) produced a BCR of **22:1***
- *RoNS Motorway projects have BCRs of 0.7-3*
  - *Total cost ~$9 billion*

Land Use is the Best Transport Solution

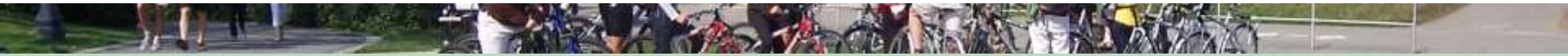
- LIVE
- WORK
- PLAY

Copenhagen, Denmark

Lower Speeds

30

Won't Lower Speeds Increase Travel Times?



- Maybe a little but…
  - Most traffic delay is due to **other traffic**
  - Most traffic delay occurs at **intersections**
  - Arterial routes generally aren't affected
- You will gain more economic benefits from:
  - **Safety** benefits of reduced speeds
  - **Health** benefits of encouraging more active trpt
  - **Retail** benefits from encouraging passing trade
  - **Property Value** benefits due to more liveability

➔ *More "Efficient" in Other Ways...*

How do we make this Happen?

Koorey G. (2011), "Implementing Lower Speeds in New Zealand", IPENZ Transportation Group Conference, Auckland, 27-30 Mar 2011

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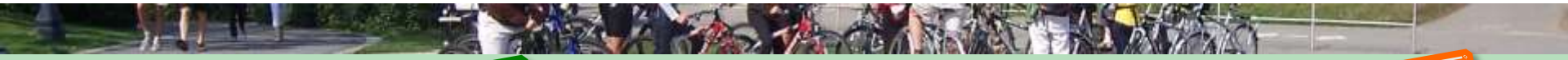

Physical Tools for Lower Speeds

AVAILABLE

Local research on Effects of Treatments

IN PROGRESS

Rules allowing Lower Speeds

AVAILABLE

Local research on Effects of Speeds

IN PROGRESS

Technical Policy Guidance

VERY LIMITED

Easily accessible info about all of this

VERY LIMITED

Public, Political & Technical Support

NOT ENOUGH HAPPENING

LOWER SPEEDS IN NEW ZEALAND

"AAA" Routes: for All Ages & Abilities

www.8-80cities.org

This Means Either...

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…Or…


INTEGRATION
with
SLOW…
…LOW…
…or NO Traffic
30
Vancouver, Canada

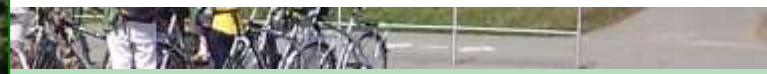
Neighbourhood Greenways

Vancouver, Canada

aka: "Bike Boulevards" or "Local Street Bikeways"

Eugene OR, US

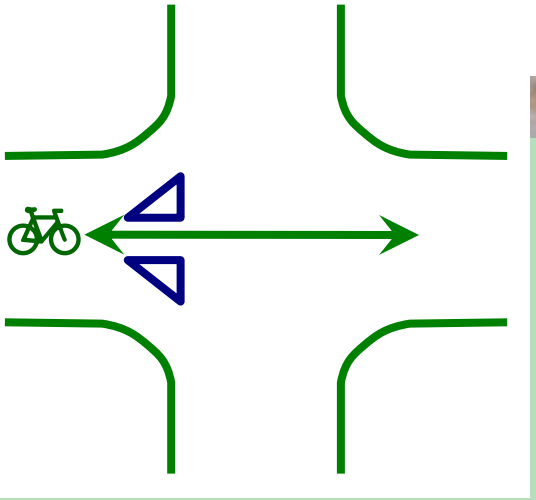
Low Speeds and Volumes

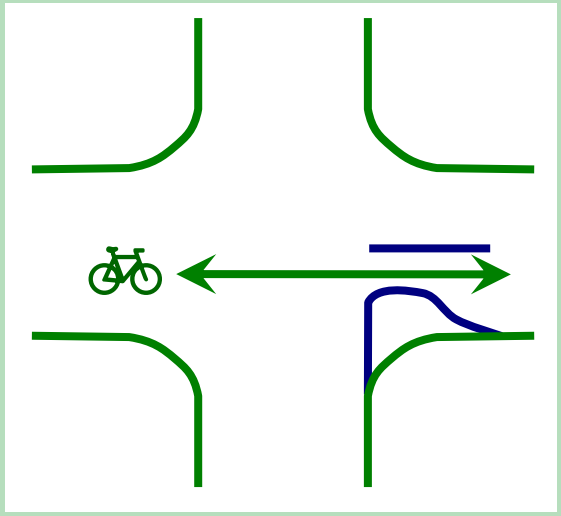


Portland OR, US

Traffic Restrictions

Vancouver, Canada

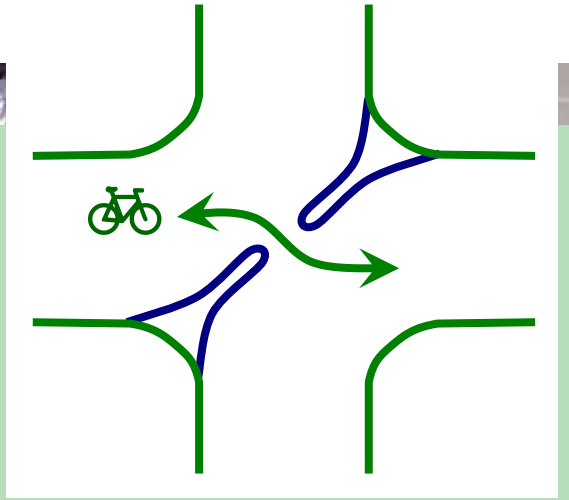


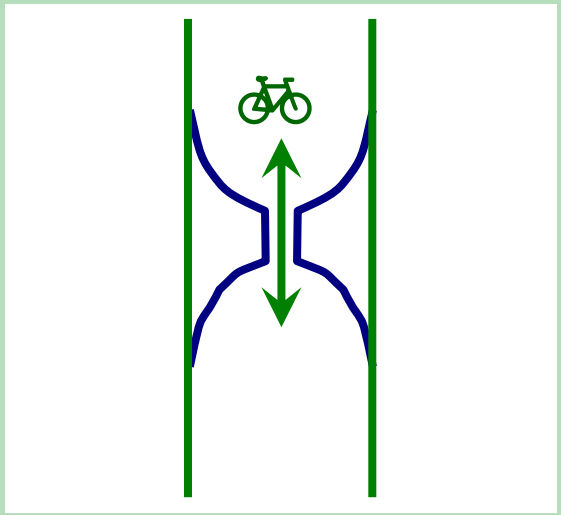


Eugene OR, US

Bicycle Bypasses

Vancouver, Canada





Major Road Crossings

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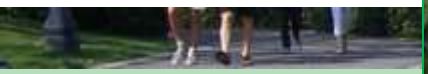
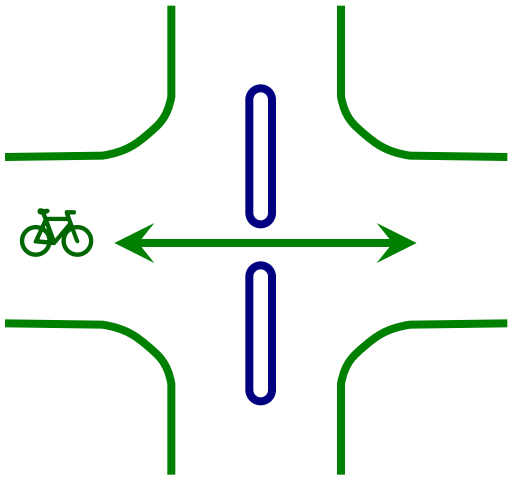


Portland OR, US



Major Road Crossings

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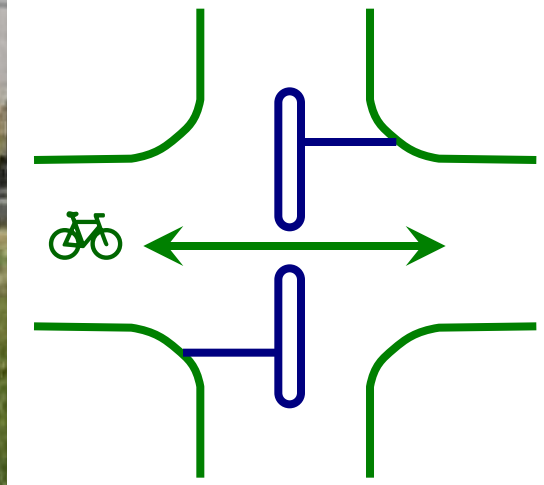
Vancouver, Canada



Separated Bikeways

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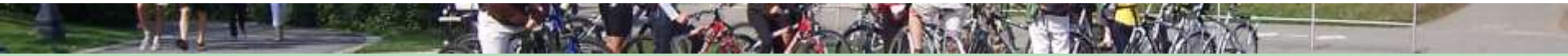
Copenhagen, Denmark

Munich, Germany

Vancouver, Canada

Melbourne, Australia

How to Separate

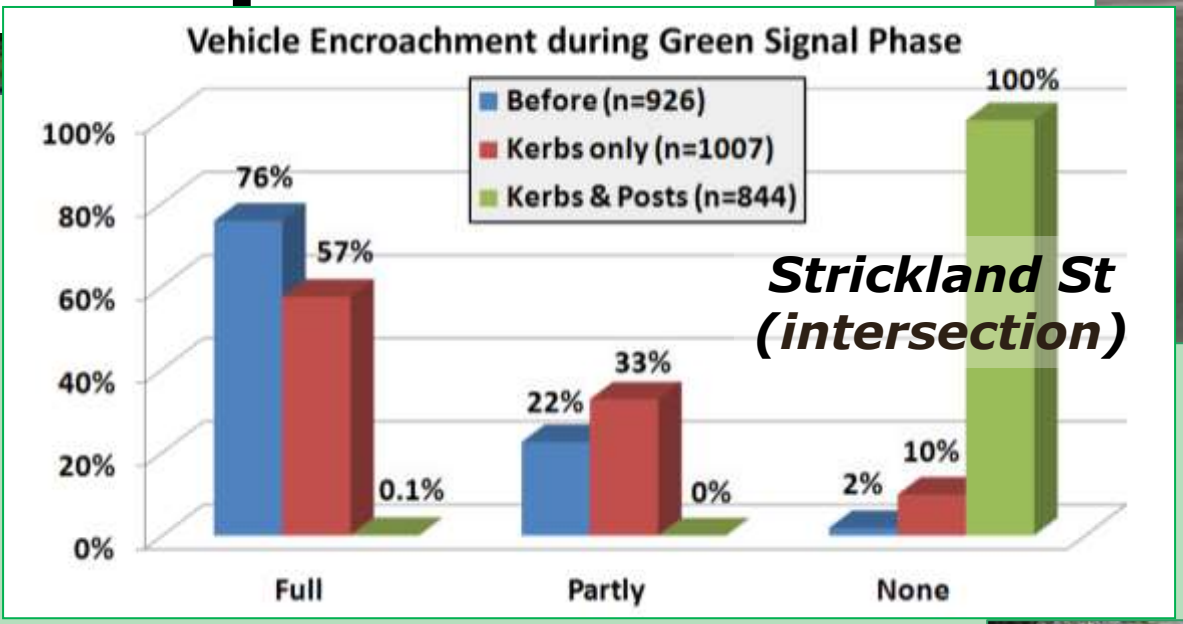


- Concrete Islands
- Small raised Delineators
- Raised Kerbs
- Grass Berms
- Vertical Posts
- Parked Cars
- Planter Boxes
- Painted Hatching

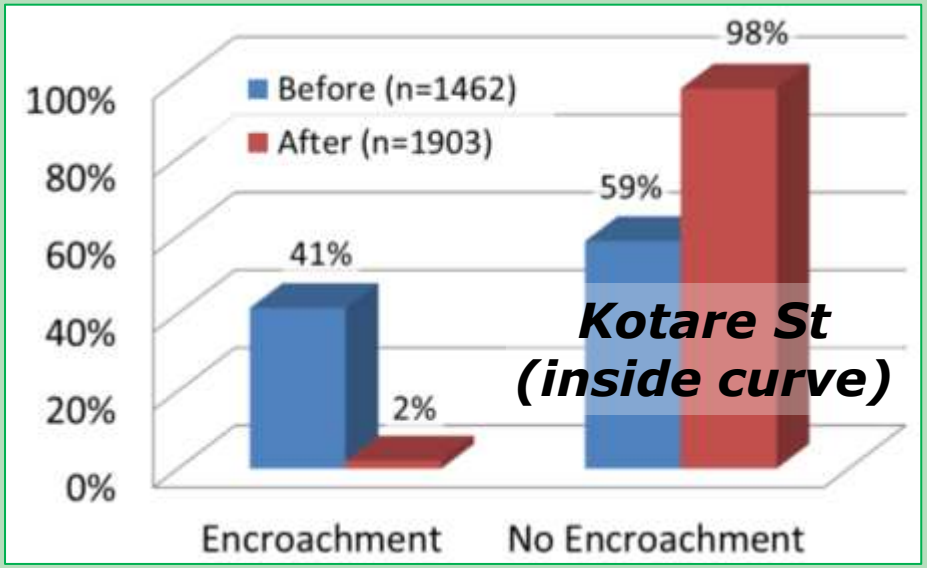
Or a combination…

Brisbane, Australia

Already Trialling Separation Here



Koorey G., Wilke A., Aussendorf J. (2013), "Assessment of the Effectiveness of Narrow Separators on Cycle Lanes", IPENZ Transportation Group Conference, Dunedin, 14-16 Apr 2013.



Try things out First using a "PPP" Approach…

the

Rise of Protected Bike Lanes in North America

Separated from traffic by parked cars, plastic posts, curbs, and even planters, the number of protected bike lanes doubled in the US in 2012 and is expected to nearly double again by the end of 2013.

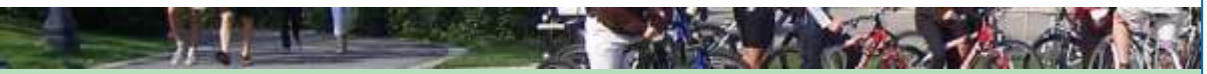
BICYCLE RIDERSHIP **BEFORE** INSTALLATION OF BICYCLE LANES

BICYCLE RIDERSHIP **AFTER** INSTALLATION OF BICYCLE LANES

MILES OF PROTECTED BIKES LANES

MAG momentum

So What's Christchurch Doing?



- Developing new cycle design guidance
- Spending a lot of Money!
  - 13 Major Cycleway Routes + "Quick Wins" programme
  - **$70 million** over 5 years
  - **$9 million** Coastal Pathway
- Creating a cycle-friendly central city (CERA/CCDU)

Chch Cycle Design Guidelines

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Chch Cycle Design Guidelines

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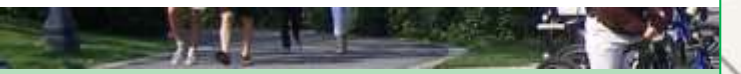

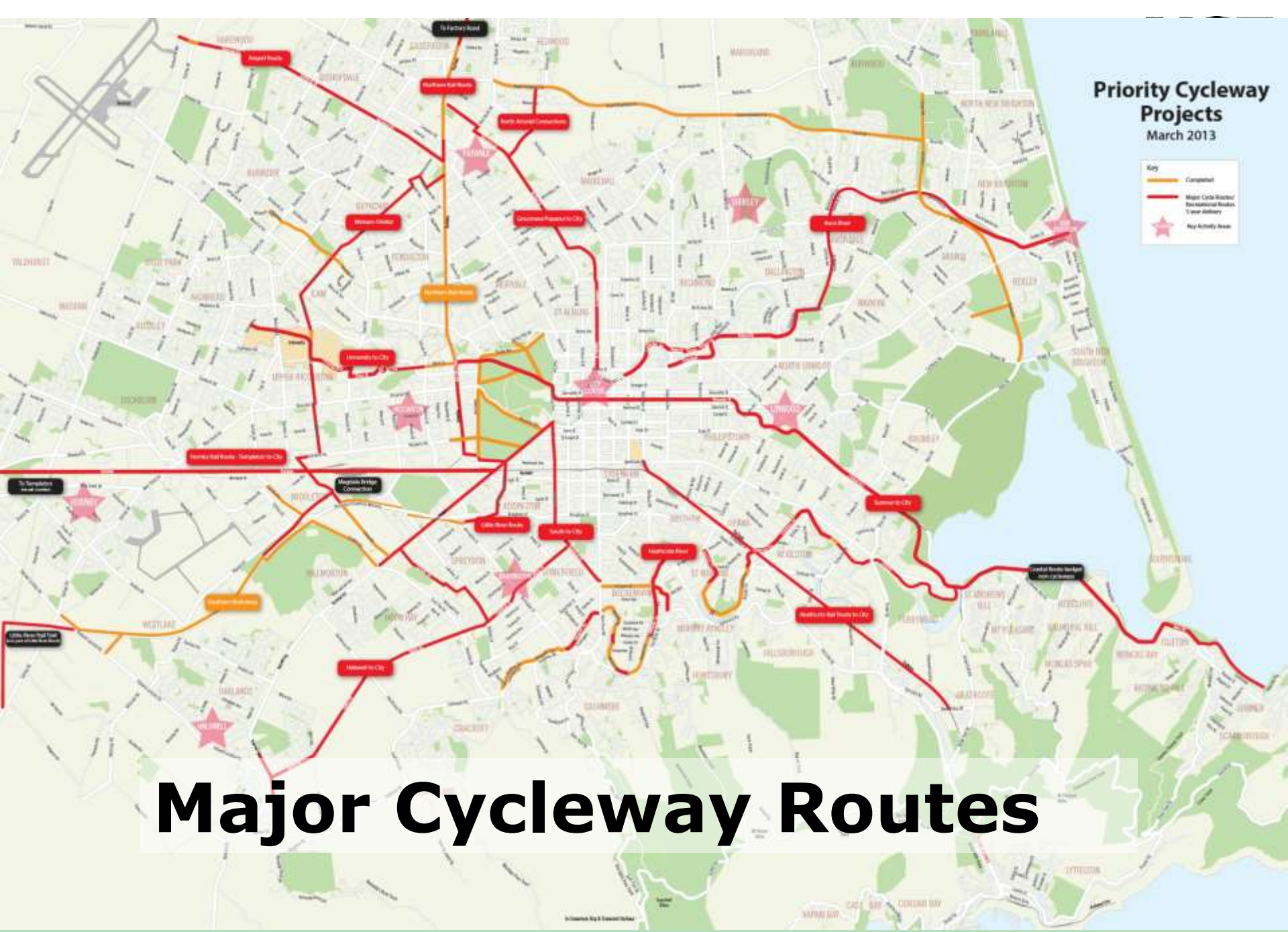

Major Cycleway Routes

A Variety of Treatments…

Central City Routes

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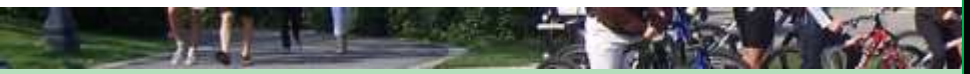
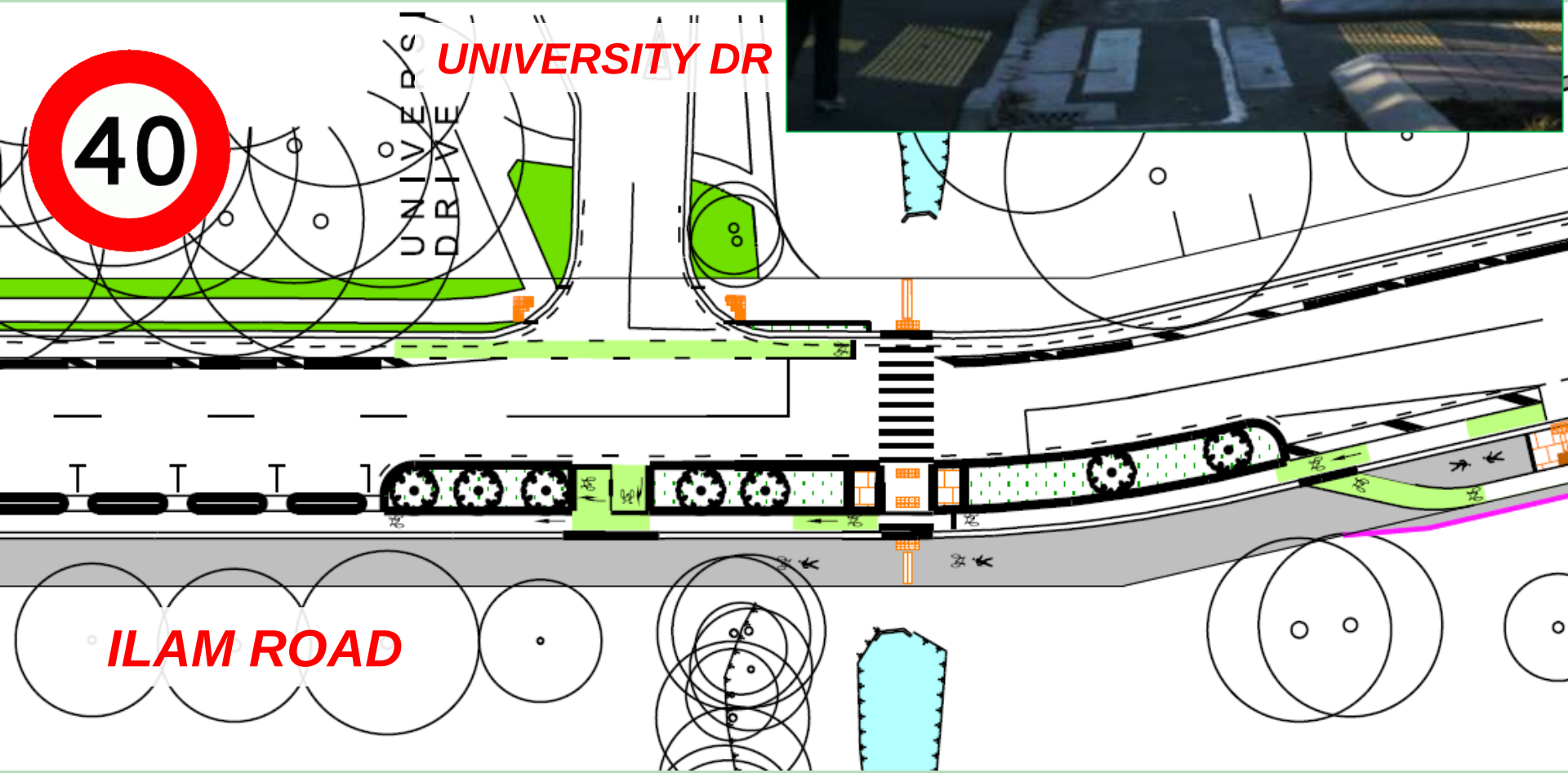
Key cycling routes in the central city

Now on Campus...





CAN cycling advocates network

bikenz Guiding New Zealand cycling to success

NZ TRANSPORT AGENCY WAKA KOTAHI

ROAD SAFETY TRUST

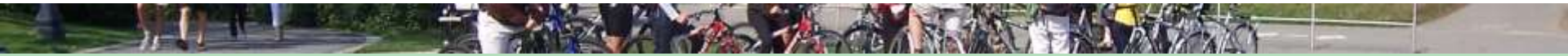
ROAD USER WORKSHOP

Thank You!

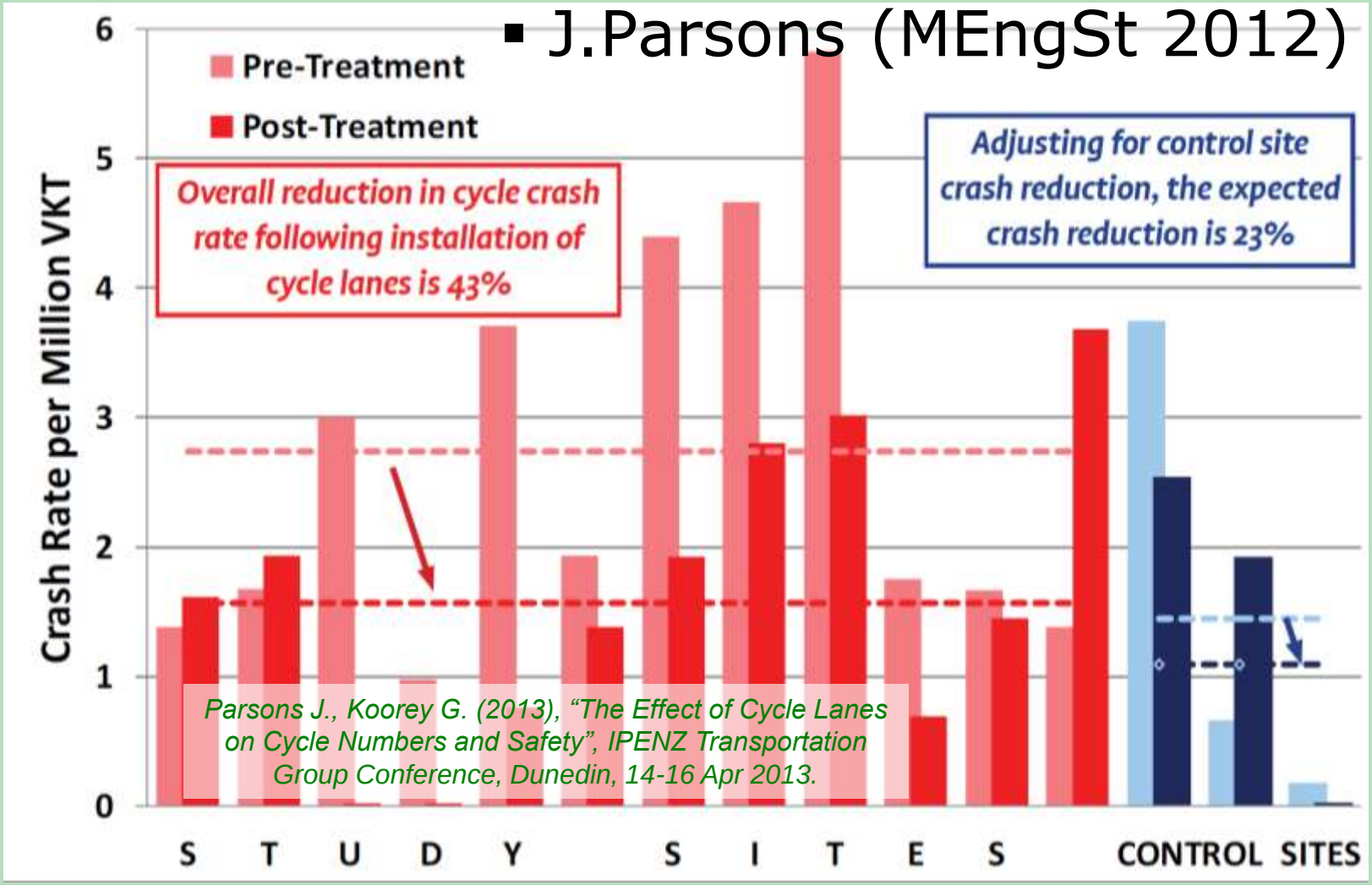
Any Questions?

- *Glen.Koorey@canterbury.ac.nz*

Effect of Cycle Lanes on Numbers & Safety



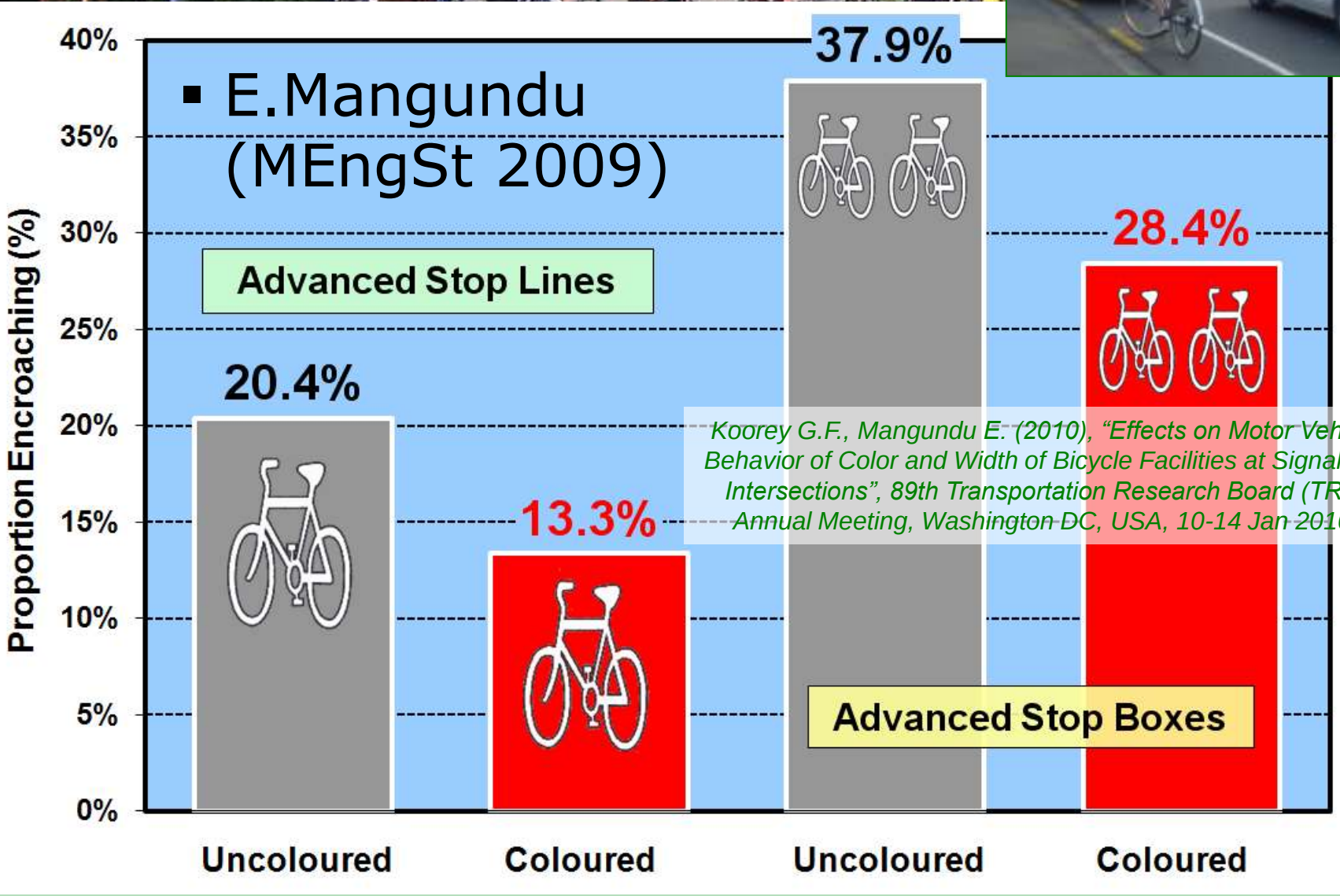
- J.Parsons (MEngSt 2012)



Parsons J., Koorey G. (2013), "The Effect of Cycle Lanes on Cycle Numbers and Safety", IPENZ Transportation Group Conference, Dunedin, 14-16 Apr 2013.

Results: Effect of Bicycle Facility Colour

- E.Mangundu (MEngSt 2009)

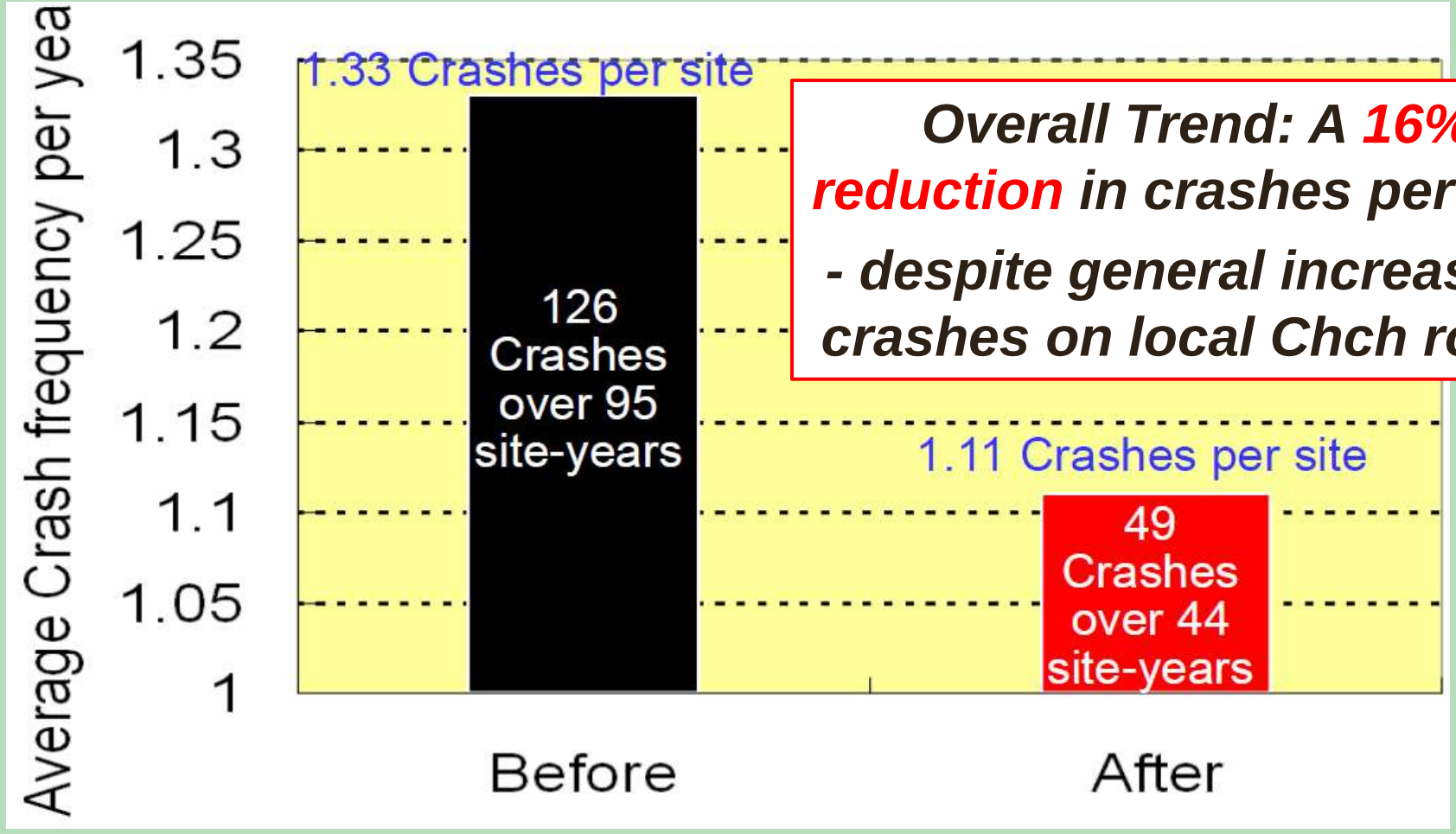


Koorey G.F., Mangundu E. (2010), "Effects on Motor Vehicle Behavior of Color and Width of Bicycle Facilities at Signalized Intersections", 89th Transportation Research Board (TRB) Annual Meeting, Washington DC, USA, 10-14 Jan 2010.

Effect of Traffic Calming on Safety

Mao J., Koorey G. (2010), "Investigating and Modelling the Effects of Traffic Calming Devices", IPENZ Transportation Group Conference, Christchurch, 14-17 Mar 2010.

- Crash Analysis from 19 Sites (J.Mao 2009)



Overall Trend: A 16% reduction in crashes per year

- despite general increase in crashes on local Chch roads